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The future of the Estonian energy sector in relation to EU 2050 low carbon economy roadmap

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Abstract

Estonia has one of the most energy intensive economies in the European Union. Its energy production has historically relied on fossil fuel, namely oil shale. The European Union Roadmap for moving to a competitive low carbon economy by 2050 provides a policy framework for the member states in order to reduce the greenhouse gas emissions in Europe. Based on Hajer's argumentative approach, this study focused on how the future of energy production is pictured in Estonia in relation to the long term energy and climate policies of the European Union. This study was based on qualitative methodology with semi-structured interviews, participatory observations and document analysis.

The findings revealed contrasting perceptions about the energy transition in Estonia. The energy discourse in Estonia was dominated by concerns about social and economic development, wherein the energy transition meant modifications in the existing energy system. Thus, socio-economic importance perceived in the oil shale industry indicate that fossil fuels will remain in the future energy production. Consequently, the environmental impacts are considered in so far as the European Union greenhouse gas reduction objective prescribes to its member states.

Keywords: low carbon economy, energy transition, Estonia, oil shale

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Popular Summary

This study focuses on how the future of energy production is pictured in Estonia in relation to the long term energy and climate policies of the European Union (EU). It investigates how different actors describe the energy sector and argue its future in relation to the EU driven low carbon energy transition.

The European Union Low carbon economy Roadmap aims at reducing the greenhouse gas emissions in Europe by 80% to 95% by 2050 compared to 1990. Together with the Energy Roadmap the EU provides a long term vision for the member states in order to initiate bold investments in green technologies and innovation in the energy sector.

The energy production in Estonia has historically relied on fossil fuel, namely oil shale. Processing of oil shale is considered environmentally damaging, contributing to air pollution and creating hazardous waste, as well as causing changes in the water regime and landscape. The most accessible and valuable oil shale deposits are found in the North-Eastern part of Estonia, Ida-Viru County, where the oil shale industry provides a significant number of jobs for the Russian-speaking population.

However, the share of renewable energy in the final gross energy consumption in Estonia has been exceeding the 2020 national target of 25% since 2011. Domestic legislation is being developed in Estonia to enable its sale of surplus renewable energy to other EU member states. The Estonian Energy Strategy 2030+ establishes a basis for future energy policy developments in Estonia, wherein the EU market mechanisms are presented as the main tools for meeting the EU climate and energy policy objectives.

This thesis draws on the social constructionism and the focuses on the energy discourse in Estonia. Hajer's argumentative approach is employed to detect the story-lines and discourse-coalitions in the Estonian energy sector. For that, various qualitative methods were used, such as interviews, participatory observation, and document analysis. In this study three key themes emerged, each of which illuminated two opposing story-lines. First, paradoxically oil shale industry was perceived to ensure energy and national security as well as to pose a security threat. Second, some actors favoured a market led approach, while others perceived purposeful policy development crucial for the energy transition. The third theme refers to the extent to which the existing energy system needs to be changed. Here, some actors foresaw modifications as being sufficient while others sought for structural change.

Through these story-lines it became evident, that energy discourse was dominated by economic and social values and concerns. Therefore, the transition pathway in Estonia was found to be guided towards energy system improvement by the market

based approach, whilst the environmental values and concerns remained secondary.

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Abbreviations

EE	Eesti Energia AS
ELF	Estonian Fund for Nature (Eestimaa Looduse Fond)
EMÜ	Association of Estonian Mineral Resources (Eesti Maavarade Ühing)
ENGO	Environmental non-governmental organisation
ENMAK	Estonian Energy Strategy 2030+
EU	European Union
GHG	Greenhouse gases
KKM	Ministry of Environment
MKM	Ministry of Economic Affairs and Communication
RE	Renewable energy

1 Introduction

In the global arena, the European Union (EU) has been one of the forerunners of sustainable development. The EU has developed multiple strategies and policies in order to reduce human impact on the environment and to address the issue of climate change, many of them focusing especially on energy production (European Environmental Agency, 2013). As a result, the Energy Roadmap 2050 has been developed in order to provide a long term trajectory for the energy policies of the member states. The roadmap foresees an energy transition that encompasses a shift from fossil fuels to renewable energy (RE) sources and places great importance on improving energy efficiency in order to decarbonise the energy sector. (European Commission, 2011b)

As the EU energy transition is realised by individual member states, it poses a variety of questions on a national level. The translation of EU and climate energy policy objectives into national policy has been accompanied by contested debate (Späth and Rohracher, 2010) due to the contextual differences and preconditions in the member states. A transition to RE sources embodies uncertainties and brings about choices which contain various trade-offs between environmental, social and economic development goals.

The aim of this thesis is to investigate how the EU driven transition to a low carbon economy is translated in the Estonian energy sector by focusing on how different actors describe the energy sector and argue its future in relation to the EU driven low carbon energy transition. As a European Union member state, Estonia has to adapt the EU energy and climate policies and work together with other member states towards more sustainable solutions for energy generation. However, Estonia has one of the most energy intensive economies in EU; relying on domestic fossil fuels while at the same time being one of the most energy independent EU member states. The Estonian energy sector is historically based on domestic fossil fuel, namely oil shale (Tammiksaar, 2014; Valgma, n.d.). However, oil shale based

energy production has environmental impacts (Gavrilova et al., 2005) that are increasingly putting pressure on the existing energy system. In such a setting, the energy transition could be expected to be rather challenging.

Thus, my interest is to understand how the future of energy production, electricity and heat production in particular, is pictured in Estonia in relation to the EU long term energy and climate policies. By using an argumentative approach to policy studies, the focus is on identifying the dominant storylines around the different energy transition pathways, and how different actors support or challenge these storylines.

Through different sets of qualitative research methods, I investigate the following research questions:

- How do various stakeholder groups in the Estonian energy sector describe the future energy supply?
- What steps are considered to be necessary in order to meet the EU long term climate and energy policy objectives?
- What are the expectations of stakeholder groups with regards to energy transition?
- How are social, economic and environmental developments and values considered and balanced by different actors?

This paper will first introduce Estonia and the current developments in the energy sector. Next, previous research on energy transition and Estonian oil shale industry will be presented. Following the theory and the methods the results will be described and discussed. In the discussion section, the findings will be further discussed and contextualised based on previous research. Lastly, the main conclusions are summarised and ideas for further research are suggested.

2 EU policies and Estonian Energy Production

2.1 European Union strategies relevant for the Estonian energy transition

The EU has committed itself and thus its member states to ambitious goals in order to mitigate climate change. The Europe 2020 Strategy was developed in 2010 after the financial crises in order to start building smart, sustainable and inclusive growth in Europe. The strategy calls for action in various domains, including climate and energy, with targets to reduce greenhouse gas (GHG) emissions by 20%, increase the share of RE to 20% and to make a 20% improvement in energy efficiency (European Commission, 2010). These targets are enforced by several directives, such as the Directive 2009/28/EC to promote RE and the Directive 2012/27/EU to promote energy efficiency, which transform them into binding objectives and force member states to take action on a national level (European Environmental Agency, 2013). Yet, the measures for meeting the EU objectives are up to the member state to decide.

Drawing on the Europe 2020 strategy, the EU has developed a Roadmap for building a competitive low carbon Europe by 2050 (Low carbon economy Roadmap). This Roadmap is a visionary document established by the EU with the aim of reducing its GHG emissions 80% to 95% by 2050 compared to 1990. Additionally, the intermediate GHG reduction targets for the pathway have been calculated to be 40% and 60% by 2030 and 2040, respectively. Moreover, the power sector is anticipated to reduce its GHG emissions from 93% to 99% by 2050 (European Commission, 2011a). This roadmap suggests a cost-efficient emission reduction per sector with the underlying purpose of ensuring secure, affordable and environmentally friendly energy for the citizens of the EU. (European Commission, 2011a)

A more detailed and energy-specific document, The Energy Roadmap 2050, has also been developed based on the Europe 2020 Strategy. The Energy Roadmap serves as an extension of the Low carbon economy Roadmap. The Energy Roadmap 2050, where electricity is given a central role in the energy system, provides member states with a trajectory that indicates the policy direction in the energy sector for post-2020 action (European Commission, 2011b). It has developed various scenarios for the future, noting that there is a lot of uncertainty attached to it. However, all the scenarios foresee a gradual shift from fossil fuels to RE sources, to a different extent. The Energy Roadmap 2050 serves to provide a long term vision for the direction the EU has chosen, and to reduce uncertainty for the member states and investors in order to initiate bold investments in green technologies and innovation. The

encouragement is described as being essential, since the investments made today will determine the energy mix and therefore its related emissions in the coming decades. The Energy Roadmap places great importance on improving energy efficiency and on substituting fossil fuels with renewable energy sources in order to meet the decarbonisation target as well as to benefit from the enhanced security and competitiveness of the European energy system. Further, research and development are prioritised, as means of supporting innovation and efficiency as well as to find answers to the currently existing technical deficiencies, such as energy accumulation. Moreover, this roadmap emphasises economic competitiveness, provision of jobs and domestic energy security that can be achieved by promoting technological innovation in the transition to low carbon economy. (European Commission, 2011b) Yet, the interpretation and realisation of the Roadmap on a national level is dependent on the national setting of a particular member states, in this case Estonia.

2.2 Background – Estonia

The Republic of Estonia is the northernmost of the three Baltic States (Latvia, Lithuania and Estonia) in Eastern Europe. After World War II, Estonia was under the occupation of the Soviet Union, however, it regained its independene in 1991. (*Estonia's history - estonia.eu*) In 2004 Estonia became a member of the EU. The population of Estonia is approximately 1.3 million people, of which roughly 1/4 are ethnic Russians[1] (Statistics Estonia (2), 2015)

The capital city of Estonia is Tallinn, which has 439 500 inhabitants. Other larger cities are Tartu (103 000 inhab., Tartu County), Narva (65 900 inhab., Ida-Viru County), Kohtla-Järve (44500 inhab, Ida-Viru County) and Pärnu (44 000 inhab., Pärnu County) (Figure 1). The total area of Estonia covers 45 227 km^2, around 50% of which is covered with forests that are rich in game. (*Estonia at a Glance - estonia.eu*) Furthermore, various mineral resources can be found in Estonia, of which peat and oil shale are particularly important in the energy context (Isakar, 2011).

2.2.1 Oil shale extraction

Oil shale is a major source of electricity generation in Estonia (Statistics Estonia (1), 2015). Oil shale is a sedimentary rock, a fossil which can be combusted to produce electricity and heat, as well as to extract shale oil. The latter is a liquid energy carrier,

[1] Ethnic nationality – the data is based on self-determination. The ethnic nationality of the mother is taken as a basis for determining the ethnic nationality of the child. (Statistics Estonia (2), 2015)

that can be refined to diesel or gasoline (*Oil shale*, 2013). Thus, energy production is understood as production of electricity, heat and shale oil. It is relevant to include

Figure 1. Map of the Estonian counties
(source: https://commons.wikimedia.org/wiki/File:EVabariik.png)

oil production in order to understand the dynamics of the Estonian energy sector. The mining, combustion, and processing of oil shale is considered to be responsible for environmental damage; causing air pollution and toxic waste formation, as well as changes in the water regime and landscape.

Oil shale can be found in many countries, however, only in Estonia does it play a central role in the economy (Gavrilova et al., 2005). Oil shale has historically played a central role in the electricity and heat production in Estonia. The mining of oil shale first began in the beginning of the 20th century as a replacement for coal, as well as a source of energy for the power of industries in the mining areas. After the Second World War, the demand for oil shale increased and oil shale gained further importance as an input to the electricity production. The know-how and technologies necessary for oil shale processing, which were developed and improved throughout the last century mainly by Estonian engineers, are in increasing demand in the world (Holmberg, 2008). In recent years, the Estonian oil shale industry has invested in other countries, such as Jordan and the U.S. By exporting their knowledge and technology, Estonian oil shale companies, particularly Eesti Energia (EE), seek to make use of oil shale deposits that are located elsewhere (Courch, 2015).

However, oil shale is not only an important source in Estonian energy and heat production, it is currently also held responsible for the majority of Estonian GHG emission. In 1990, which is the reference year for the Kyoto Protocol as well as for the EU Low carbon economy Roadmap, the GHG emissions in Estonia were remarkably higher than they are today. According to the most recent Estonian National Inventory Report (NIR), under the United Nations Framework Convention on Climate Change (UNFCCC), the total GHG emissions in the country have decreased by 45.7% in 2013 since the base year 1990. (The Ministry of the Environment, 2015). Extensive reduction in emissions occurred as a result of the Estonian restoration of independence in 1991, and the consequent restructuring of the economy. Nevertheless, the energy sector in Estonia is still accountable for a large portion of CO_2 emissions. In 2013, the energy sector alone contributed 87.6% of the total GHG emissions, with energy industries being accountable for 80.5% of the sectors' emissions and for 71.5% of total GHG emissions. Moreover, the share of oil shale in the total primary energy supply has increased from 52% in 1990 to 68% in 2013 (The Ministry of the Environment, 2015).

The most accessible and valuable oil shale deposits are found in the North-Eastern part of Estonia. (Koel, 1999) Therefore, the oil shale industry is located in Ida-Viru County (Ida-Viru maakord, colloquially Ida-Viru maakond) (Figure 1). Central electricity power plants near the deposits were constructed in the 1960s-1970s (Gavrilova et al., 2005). Since then oil shale has remained central in the electricity and heat production in Estonia (Gaškov et al., 2012).

Figure 2. Oil shale (photo: Maris Neeme, Ida-Virumaa)

The industry provides a significant number of jobs in the county, where around 72% of the population is Russian by ethnic nationality, and the unemployment rate is twice as high as the national average (Statistics Estonia, 2016). The average gross wage in Ida-Virumaa has constantly been lower than the Estonian average; for example, in 2011 it was 16% lower as compared to the national average. (Pihor et al., 2013)

These socio-economic aspects have increased the importance of the oil shale industry in Estonia as can be detected from various media publications and the public debate, where oil shale is often associated with upheld employment rates in Ida-Virumaa.

It is also noteworthy that approximately 90% of the total oil shale excavated is mined by the state owned company EE (Gaškov et al., 2012). Nevertheless, there are other active private actors in the oil shale sector, who mine and process oil shale. About 80% of electricity is generated from oil shale (*Elektri tootmine*, 2015), even though the process has very low overall efficiency (Gavrilova et al., 2005). This is indicated by the energy intensity value, which is defined as the ratio between the gross inland consumption of energy and the gross domestic product (GDP) for a given calendar year (*Eurostat (1)*, 2015). This indicator shows Estonia to be the second most energy intensive economy in Europe, resulting in a rate three times higher than the average of the EU-28 (Figure 3).

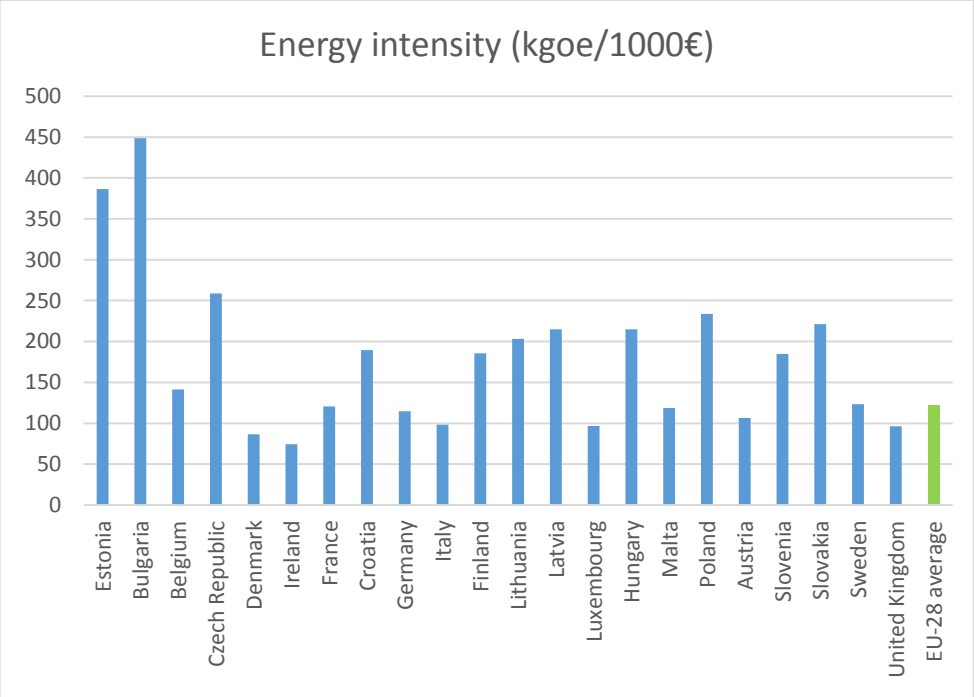

Figure 3. The energy intensity of the economy in 2014 given in kilogram of oil equivalent per 1000 Euro (*Eurostat (1),* 2015*)*

The generation of electricity, which is to a large extent still based on the combustion of oil shale, has exceeded local needs, which is why electricity has become an important subject for export (Elering, 2014).
Additionally, shale oil production has increased remarkably since 1990. It has been a great export product in light of high prices on the global oil market (The Ministry of the Environment, 2015). Due to its domestic energy sources, Estonia is considered to be rather independent, having one of the lowest energy dependency percentages amongst the 28 EU member states (*Eurostat (2),* 2015).
In the beginning of March 2016, the Estonian Government decided to temporarily reduce environmental taxes in order to reduce the burden on the oil shale industry. (Postimees, 2016b; *Keskkonnaministeerium*, 2016). This was explained to be necessary to uphold the operation of the industry in light of low global oil and electricity prices. The change is projected to enter into force on July 1, 2016 and lasts until the January 1, 2018 (Põhjarannik, 2016).

2.2.2 Renewable energy

Under the RE directive 2009/28/EC Estonia has committed itself to achieving 25% renewable energy share from the gross final energy consumption by 2020 (European Parliament and Council of the European Union, 2009). However, Estonia has preconditions which have fostered the early achievement of the EU 2020 climate and energy policy objectives, as already noted in relation to the GHG emission reduction. In 2005, which is the reference year for the RE 2020 objective, the share of RE in Estonia was already 17.5% (*Eurostat, 2014*), meaning only an increase of 7.5% needs to be achieved within the 15-year time frame.
The share of RE in the final gross energy consumption of Estonia is already exceeding the 2020 national target of 25% since 2011. (Figure 4)
Thus, Estonia is the first country in the EU to fulfill its 2020 RE target. *(Estonian Windpower Associatio*n, 2016). The largest share of renewable sources was used in the heat sector, where RE accounted for 43% in 2013. In the electricity sector it accounted for 13.2% and in the transport sector 0.2% (Potisepp et al., 2015).
The Estonian renewable energy action plan which was submitted under the EU Renewable Energy Directive sets sector based targets as follows: 38.4% of renewable energy in heat and cooling; 17.6% of RE in electricity, and 10% of RE in transport, with a total of 25% (Ministry of Economic Affairs and Communication).

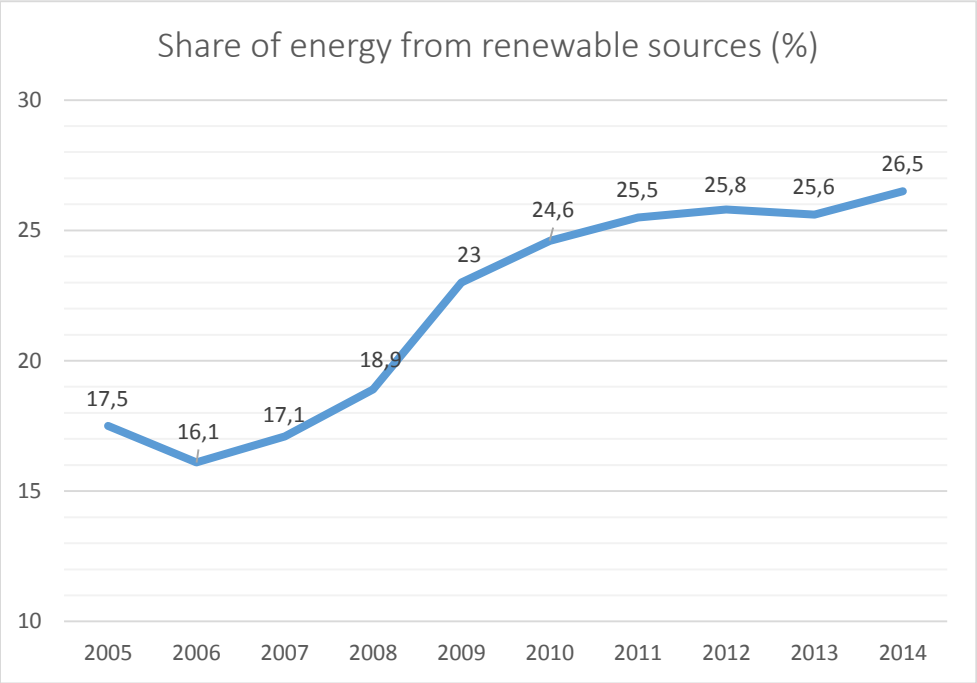

Figure 4. The percentage of renewable energy in gross final energy consumption (*Eurostat*, 2014)

The renewable Energy Directive 2009/28/EC introduced Cooperation Mechanisms, which enables the sale of the excess RE to countries that have difficulties with meeting their targets (*European Commission*, 2016). Currently, domestic legislation is being developed in Estonia order to enable the surplus RE to be sold to other EU member states in the form of statistics[2] (Postimees, 2016).

2.2.3 Estonian Energy Strategy 2030+

The Estonian Energy Strategy 2030+ (ENMAK) establishes a basis for future energy policy developments in Estonia. (Ministry of Economic Affairs and Communication, 2015) Yet, it should be noted that the document has recently been submitted to be approved by the Ministries and for this reason should not be considered final (*Eesti pikaajaline energiamajanduse arengukava 2030+*, 2015). Nevertheless, as the analysis and initial decisions about the suitable scenarios have been made, the strategy is used to illuminate different problem definitions associated with the energy transition.

[2] In a statistical transfer, an amount of renewable energy is deducted from one country's progress towards its target and added to another's. This is an accounting procedure and no actual energy changes hands. (*Cooperation mechanisms - Energy - European Commission*)

ENMAK is a policy framework produced by The Ministry of Economic Affairs and Communication, which visualises the policy developments in the energy sector until 2030 and 2050. The document emphasises that ensuring Estonian long-term energy independency is the basis for the wellbeing of Estonian citizens, the competitiveness of Estonian entrepreneurs, and Estonian energy security. On the one hand, the document recognises the need of the state to interfere in order to reduce the final consumption of energy, as without it the energy consumption is projected to increase. However, on the other hand, the RE targets are left to be guided by market mechanisms (Ministry of Economic Affairs and Communication, 2015).

According to ENMAK, electricity generation is a great contributor to the economic efficiency, since besides the direct utilisation of primary energy resources, production residues, which have no output elsewhere will be employed for electricity purposes. Keeping in mind the long-term EU climate and energy politics, electricity production from oil shale has to shift from direct combustion to co-production of shale oil and electricity, thereby extending the value chain, improving efficiency and lowering the environmental impacts.

Electricity production must be competitive on the regional market without subsidies, with any subsidies only being implemented in exceptional circumstances, and only if absolutely needed, in order to comply with the RE targets. Similarly, in the heating system the political choices and measures must depart from the idea, so the system must be sustainable without subsidies.

Market mechanisms such as Cooperation Mechanisms and the EU-wide Emission Trading System are seen as main promoters of investments. National subsidies as a basis for the development of new electricity capacities must be replaced by efficient and reliable Emission Trading System and EU-wide RE subsidy schemas. The strategy emphasises that primarily, due to effectively functioning ETS, and the implementation of the planned investments in oil shale industry, the share of renewable energy in the final electricity consumption is predicted to be 30% by 2030 and the average CO_2 emission from electricity production is foreseen to be reduced to about 4.5 million tons per year (in 2012 it was 12 million tons). The majority of the RE is foreseen to be sourced by biomass and wind (Ministry of Economic Affairs and Communication, 2015).

3 Previous research

3.1 Managing energy transitions

Policy and related debates on energy transition have received a lot of scholarly attention in various countries due to the raising concern over climate change and resource use.

The concept of 'transition management' as a concept has been widely employed in the transitions of energy systems. Kemp et al. (2005b, p. 42) have defined transition management as "a deliberate attempt to bring about structural change in a stepwise manner" to pursue sustainability that would offer environmental, social and economic benefits (Kemp and Loorbach, 2005). The energy transition in the Netherlands has found a lot of attention in recent research (Kern and Smith, 2008; Meadowcroft, 2009, Kemp et al., 2007) as the transition management concept was adopted by the government as a policy model in order to address the unsustainability of the existent energy system (Kern and Smith, 2008). In order to prevent the premature lock in of a technology, the government created a space for different technologies to emerge and develop. A problem found by Kern et al. (2008) is that stakeholders perceive such flexibility as indecisiveness and lack of commitment. Further, regime energy companies, i.e. incumbents, were found to be dominant in the energy transition (Kemp and Loorbach, 2005; Kern and Smith, 2008) that is likely to restrain the structural change. Although, the space for innovation was created in the Netherlands, Kern et al. (2008, p. 4101) point out the lack of control policies which are "necessary to pressure the regime and change the selection environment to create market pull for green innovations". Moreover, the existing Dutch RE policy received criticism for being unstable, and thus reducing the security for investors. (Kern and Smith, 2008)

Meadowcraft (2009) has elaborated on the transition management concept and suggests that in order to avoid a 'lock-in' effect of an existing energy system, policy makers should simultaneously encourage 'system improvement' and 'system innovation', wherein the former refers to modifications of the existing practices and the latter implies new experimental solutions. According to Geels (2004, p. 19), "system innovation can be understood as a change from one socio-technical system to another" that encompasses comprehensive changes in technology, evokes new actors and affects the existing social and institutional arrangements (Kern, 2011). Focusing only on system improvement may prove to be sufficient if the problem is rather mild or if the existing technology has higher adaptive potential than initially expected (Meadowcraft, 2009). Yet, Kemp et al. (2005b) argue that investing

primarily in ‘system improvement’ will sustain the existing system and stimulate the lock-in effect. Moreover, according to Kemp et al. (2007), the key problems found in change management are the differences in peoples’ divergent perspectives about the problem and the solution, distributed control among the various actors representing distinct understandings, the danger of getting locked in to a non-optimal solution and the political myopia, which refers to the long timeframe before the results of transition become visible.

According to Markard et al. (2016, p. 216), “transitions are characterized by fundamental uncertainties, which means that even the formulation of a policy problem is ambiguous and contested, let alone policy goals, strategies and expected outcomes“. Thereby, cognition and framing are particularly important in order to understand the aims and processes behind energy transition.

Markard et al. (2016) argue policy change to be the key for energy transition, since policies may encourage energy transition but they may as well constrain it. Further, Markard et al. (2016) argue energy policies to be the result of politics, whereby the latter notion implies to a struggle between various actors who seek to legitimise their understandings of a problem. Markard et al. (2016) study energy policy in Switzerland and reveal two rather stabile discourse coalitions – a pro-ecology coalition that sees public policy as necessary for energy transition, and pro-economy coalition which supports the existing energy system with its economic benefits. (Markard et al., 2016). Although, the coalitions were analysed based on their belief system, their respective indications to the transition approach appear to be similar to the ones emerging from my study.

In order to analyse the transition, Geels et al. (2007) have suggested three analytical levels based on a multi-level perspective: regime, landscape and niches. Herein, regime encompasses the current arrangement of technological solutions, practices, regulatory environment, and competencies (Kern and Smith, 2008). The landscape implies to external pressures such as climate change issue or market changes (Kern and Smith, 2008; Geels and Schot, 2007). If neglected by the regime actors, societal pressure groups draw attention and insist on solutions for the consequences resulting from landscape pressures (Geels and Schot, 2007). The niche level provides an arena for new innovations such as renewable energy technologies and actors to emerge. System innovation can be anticipated as a result of interaction between these three levels (Kern and Smith, 2008).

Before the purposeful transition management, liberalisation and Europeanisation had been the main drivers for the energy policies in the Netherlands (Kern and Smith, 2008). Raven (2004, p. 33) argues that “with the liberalisation the long-term planning of future power plants and securing reliability of supply is jeopardised by the preference for short-term return investments”. Moreover, Verbong and Geels (2007) suggest that liberalisation and Europeanisation, and the low profile of

environmental problems prevent the transition towards a sustainable electricity system. Contrarily, Markard and Truffer (2006) argue that liberalisation may be precisely the driver of innovation, which thereby weakens dominant technologies.
Jaspal et al. (2014) studied the energy discourse in the United Kingdom by analysing media publications and found that the debate consist of opposing perceptions on shale gas and fracking. Interestingly, similar notions, such as 'threat', were commonly used to mobilise both the anti-fracking and pro-fracking actors. On one side, fracking was presented as posing a threat to human health and the environment, while on the other side, fracking was framed as a solution to the threat (Jaspal and Nerlich, 2014). Cotton et al. (2014) revealed the frames of fracking such as clean vs. dirty, transition fuel vs. diversion fuel, and contested views on procedural and distributive environmental injustice. Moreover, they found that shale gas fracking in the UK was framed using the metaphors of environmental, social and economic development across both pro and anti-shale gas coalitions. Yet, the government, in the pro-oil shale gas coalition, prioritised economic development over the potential environmental impacts. Negative environmental impacts are presented to be manageable through regulation and opposition could be managed by incentivisation of the local communities and authorities. Consequently, the various story-lines were found to have little impact on the UK shale gas policy, as the dominant story-line presented by the government emphasised global competitiveness, energy security and profitability (Cotton et al., 2014).

3.2 Energy, ethnicity and Estonian independence

While transition management is generally well covered in scientific literature, there are only a few studies which focus on the developments of the Estonian energy sector (Auer, 1998; Holmberg, 2009). Nevertheless, a few inter-disciplinary studies can be found, which are interestingly conducted by foreign researchers. Auer (1998) analysed the impacts of the oil shale (as well as phosphorite) industry on Estonian independency, and its interdependency with environmentalism. The study provides an understanding of the connections between the current distribution of ethnic nationality in Ida-Virumaa, and its relation to the oil shale industry. After World War II, when the oil shale industry reactivated and expanded, Estonians were reluctant to work for it for various reasons (environmental concerns, feeling of injustice, unattractive working conditions), which is why the labour workers had to be imported from elsewhere in the Soviet Union. Auer (1998) argues that the environmental concerns in Estonia posed by the oil shale industry were largely influenced by the ethnic and economic colonialism that at the time was strongly opposed by ethnic Estonians.

A more recent study, which provides a historical contextualisation of the oil shale industry in Estonia, is offered by Holmberg (2008). Holmberg (2008) reveals the forces that support the persistence of the oil shale industry, such as the wish to maintain energy independency, little competition among energy providers, lack of alternative sources, scale of the technology and the social conditions in Ida-Virumaa:

> "…massive build-up of power generation was perceived as further evidence of Soviet colonialism by many Estonians. However, when the Soviet institutional structure collapsed, this very same technology not only survived, but turned out to be of the utmost importance in terms of security of supply for the re-established Estonian state." (Holmberg, 2008, p. 300)

The forces that may reduce the lock-in of the oil shale industry identified by Holmberg (2008) were changes in the knowledge base and societal attitudes, development of competing technologies, environmental hazards, slow technological progress in the oil shale industry, the settlement structure of Estonia, international cooperation, and the depletion of oil shale resources.
Although Holmberg (2008) finds various factors that encourage the lock-in of oil shale as well as the lock-out of alternative resources, he suggests that Estonia has the tools to deal with the upcoming challenges in the energy sector, if there is political will.

4 Theory

This study draws on social constructionism that rejects the idea of the objective truth. As the world is being continuously interpreted and redefined by people, the essence of a phenomenon does not reside in itself. Rather it lies with the group of people who have assigned a particular meaning to the phenomenon. (Patton, 2015) Social constructionist inquiry seeks to capture the various perspectives different people have about the world or a phenomenon in a particular context that have implications for the 'real world', i.e. on the materialisation of reality. The social constructionist approach enables to reveal the multiple realities. Herein, the perspectives on future energy production amongst actors in Estonian energy sector are examined, as they affect and shape the policy outcomes. By analysing the patterns in those different realities I seek to reveal whether and how those perceptions influence the development of energy policy.

4.1 Discourse analysis

In order to find the patterns in the various perceptions that become exposed through language, discourse analysis will be applied. The discourse analysis builds on the idea that "our ways of talking do not neutrally reflect our world, identities and social relations but, rather, play an active role in creating and changing them." (Jørgensen and Phillips, 2010, p. 1) In other words, we give meanings and shape reality by the specific way we express ourselves through language.

I understand discourse as defined by Hajer (1995, p.44) as "a specific ensemble of ideas, concepts, and categorisations that are produced, reproduced and transformed in a particular set of practices and through which meaning is given to physical and social realities". Discourse is seen as a constitutive of the realities in environmental politics. Those socially constructed meanings, according to Hajer (1995), are directly related to the formulation of a problem and its political response. Problem definition provides basis for regulation and has direct consequences in its political action. Therefore, the focus of this study remains on the struggle over the definition of a problem. In the following analysis I will identify the different perceptions that come to affect problem definition. Since problem definition constitutes and shapes the consequent political response it can reveal which parts of social reality are included and which are excluded in the definition (Hajer, 1995).

Hajer (1995) brings in the concept of 'argumentative game', where the strength of the argument is defined by its credibility, acceptability and trust. Credibility is necessary to make actors believe in the implied subject-positioning, acceptability makes the position attractive, and trust enables the argument to overpower the doubts of other actors, if confidence can be ensured in the author of the arguments.

According to Hajer, discourse in a given domain can be seen as hegemonic with the presence of 'discourse structuration' and 'discourse institutionalisation'. Discourse structuration indicates to the necessity for the actors to apply certain concepts and ideas in a given domain in order to maintain or enhance their credibility. In other words, actors have to adapt particular terms to present their ideas in order to be perceived acceptable. A discourse institutionalisation occurs if those (prevailing) concepts and ideas are converted into actual policies (Hajer, 1995).

4.2 Argumentative approach

Hajers's (1995) argumentative approach will be employed as a lens to investigate my empirical data. The approach suggests two concepts, story-lines and discourse-coalitions, as tools for describing how the discursive orders are sustained and reconstructed.

First, *story-lines* serve as "mediums through which actors try to impose their view of reality on others" (Hajer, 1993). The multiple physical and social phenomena are translated into story-lines that unite the knowledge, position the actors and create coalitions amongst the actors of a particular field. New story-lines stimulate the cognitions that as a result may change peoples' ideas about their role, and the possible openings for change, i.e. new subject and structure positioning may emerge. Story-lines not only contribute to the construction of a problem but also affect the social and moral order in a specific domain as they facilitate the positioning of the actors. Further, through story-lines the understandings about "blame", "responsibility", and "urgency" are shaped. The cognitive commitments that are inherent in these story-lines enable and uphold the reproduction of the existing discursive order (Hajer 1995).

Furthermore, story-lines often indicate an arbitrary fixation, since they conclude ongoing debates or represent an idea far from any academic belief. Yet, actors become attracted and attached to new ideas that introduce them to alternative ways for understanding and defining the physical and social phenomena that are manifested in the contemporary environmental conflict. The cognitive power and attractiveness embedded in the story-line determines the magnitude of influence a policy discourse will have (Hajer, 1995).

Although the story-lines reduce the discursive complexity, it is important to understand what drives actors to promote a particular metaphorical conception. In order to withdraw from a too individualistic explanation Hajer (1995) introduces the idea of "*discursive affinities*". He claims that the discursive power of a story-line depends on the discursive affinities, which means that "separate elements might have similar cognitive or discursive structure which suggests that they belong

together" (Hajer, 1995, pp. 66–67). Hajer (1995, p. 62) argues that the "regulation of conflict over an inter-discursive problem depends on and is determined by effects of certain story-lines." Herein, story-lines are understood as narratives consisting of various elements from different disciplines. Combined together, the elements present a set of symbolic references that enable a common understanding for the actors. The story-lines can be seen as metaphors as an entire story-line can be re-evoked by uttering a specific element. Argumentative discourse analysis considers the story-line to be powerful if it sounds right. The latter, however, depends on the plausibility of the argument itself, the trust expressed towards the author, the practice of the argument, and the compatibility between the story-line and peoples own discursive identity (Hajer, 1995).

The second key concept in the argumentative approach is *discourse-coalition*, which refers to the coalitions that are formed among actors who for divergent reasons become attracted to the same specific story-lines. Discourse-coalitions thus share a view that ties them together and enables them to uphold the discursive order by expressing themselves in a particular context by using the same story-line. Such coalitions can be characterised by the array of story-lines, actors uttering the story-lines, and practices where these discursive activities take place. Discourse-coalitions differ from traditional political alliances as they are formed through story-lines rather than pure interests. Discourse-coalitions are formed when separate practices become engaged and active in a political project through which common meanings are assigned to some aspects of reality. Contradictory utterances of an actor may indicate that their practices give strength to several coalitions. The use of an alternative storyline, even for criticising a rival is a sign of acknowledgement of other perspectives. This may be seen as a reproduction of the particular discourse-coalition that is committed to the referred story-line (Hajer, 1995).

The argumentative approach rejects the idea that perceptions and understandings are to be understood as a result of a belief system; rather people are seen to hold inconsistent value positions. The value positions, however, can be altered by new discourses that may encourage a change of cognitive commitments. Furthermore, interests cannot be taken for granted; rather they are constantly created as part of the interaction. The used language may reshape the existing cognitions and create new understanding. Thereby, individuals' perceptions about problems, as well as possibilities, may be challenged by new discourses and create a space for new coalitions. Consequently, discourse is seen to have an essential role in delivering a political change (Hajer, 1995).

5 Methods

In this chapter, the methods for data collection and analysis, used in this study are described.

5.1 Research approaches

This study is based on multiple qualitative research methods in order to triangulate and validate my findings. In particular, I apply the emergent design methods which develop and are shaped within and throughout the whole research process (Patton, 2015). This means that the design implemented will only become apparent retrospectively, as new ideas and opportunities arise during various stages of the research, such as data collection, analysis and discussion. For instance, initially I planned to base my study on interviews only, but new opportunities emerged in the data collection phase.

The methods used throughout this study are described in more detail in the following sections.

5.2 Interviews

The main part of the empirical material originates from 7 semi structured interviews, out of which one was more informative. The interviewees were representatives of the key organisations in the Estonian energy sector. The organisations and their role are further described below based on information publicly available on their websites.

Estonian Ministry of Economic Affairs and Communications (MKM)

Their focus is on enhancing the competitiveness of Estonian economy by developing, drafting, and evaluating Estonian economic policies. As noted on their homepage, "the main strategic objectives of the Ministry involve governance that encourages entrepreneurship and innovation, an efficient and safe transport system, constantly developing information society and environmentally friendly energy supply at justified price" (*Ministry of Economic Affairs and Communications, n.d.*).

Estonian Ministry of Environment (KKM)

KKM aims to ensure a clean living environment, diverse nature and the sustainable use of natural resources for the current and following generations. The tasks of the Ministry include, but are not limited to the use, protection, keeping record of the natural resources, and organising the use of external tools for environmental protection, as well as compiling strategic documents and draft legislations (*Ministry*

of the Environment, n.d.).

Nelja Energia

Nelja Energia is a privately owned company with a mission to develop RE and the operate the power production in the Baltics. The name itself "nelja" means four and refers to the four sources of RE: wind, solar, water and biomass. However, the company is mainly focusing on wind, and to some extent on biomass and biogas. (*4Energia, 2015*). The majority of shares belong to a Norwegian company, Vardar Eurus, and the remaining shares are distributed between several Estonian investors (*Estonian Windpower Association*, 2015).

Eesti Energia (EE)

Eesti Energia was established in 1939. EE is a state owned energy company that has recently expanded its activities abroad. It is the most important energy company and the largest employer in Estonia. Approximately 6000 people working in the company, 72% of which in Ida-Viru County. As the company mainly focuses on oil shale, the technical expertise of EE is considered unique in the world. The aim of the company is to produce electricity from various sources, thereby reducing greenhouse gas emissions. Therefore, renewable energy sources such as wind, water and biomass are employed.

However, the oil shale based Narva power plants provide 90% of the Estonian electricity and supply the whole Narva town with heat. Narva power plants are the world's largest power stations running on oil shale. The new Auvere power plant, which is using the most advanced technology enables up to 50% of the oil shale to be replaced with environmentally friendly biomass (*Eesti Energia, n.d.*).

Association of Estonian Mineral Resources (EMÜ)

EMÜ is a non-governmental organisation that functions on a voluntary basis. It was established by seven civil society organisations to offset the debate around the utilisation of mineral resources, which is mainly lead by business interests. The funding for the organisation comes from donations and project grants (*Eesti Maavarade Ühing, n.d.*).

Estonian Fund for Nature (ELF)

ELF is an environmental non-governmental organisation that was established in 1991 in cooperation with the World Wildlife Fund and has been actively involved in many projects concerning nature conservation and biodiversity in Estonia. Currently, the organisation focuses on conservation as well as on sustainable development and nature education. The financial resources come from paid conservation work, donations, and projects' grants (*Eestimaa Looduse Fond, n.d.*).

The interviews were held in Estonian, recorded and then fully transcribed. A concise summary of the interviews can be found in the Appendix. Each one of the interviews lasted from half an hour to an hour and a half, depending on the interviewee. In order to maintain the anonymity of the people interviewed, I refer to them as "s/he" or the "interviewee".

While preparing the research, I held a pilot-interview with a person working in a non-governmental organisation that brings together all organisations related to RE production. The interview lasted for an hour and the interviewee shared what s/he perceives as problematic at the moment in the Estonian energy sector and what the ongoing relevant debates are about. I also received a list of people and organisations that could be relevant for my topic.

As for the sampling method, I combined snowball sampling, maximum variation sampling and the selection of key informants. (Patton, 2015) First, the snowball method implied that all the interviewees were asked about other relevant actors. The first actors were named by the pilot interviewee and it should be noted that many of them become part of my research as the same organisations got mentioned during the following interviews. Nevertheless, I was not able to interview all the actors that were suggested by the interviewees. Secondly, the maximum variation sampling was applied in order to enhance representativeness. That was done by the involvement of all the divergent and potentially conflicting opinions that I was able to detect. As it is the matter of similar and different patterns, I seek to investigate the various perspectives represented by multiple organisations. The third method of the key informants, i.e. people who have deep knowledge about the topic, was used to strengthen the validity of my results. The selection of key informants became especially important as the interviewees started to suggest that I meet people who share their understanding of the problem. In order to reduce bias that started to arise due to the diverging interests of the participants, I chose the representatives from each organisation based to their job position in that organisation. The position had to be (or at least appear) influential in designing the organisations' opinion about energy issue.

The interviews were planned to be held as semi-structured interviews. Themes such as the practice of the organisation, energy sources and low carbon economy, and underlying sub-themes were designed to cover the topics pre-defined as important. However, as I started off, I realised that following the sub-themes that I had prepared were limiting me to certain questions and disabling me from building upon the matters emphasised by the interviewee. For that reason, rather than firmly adhering to them, I adapted to the conversation and started asking questions that emerged from the different roles and concerns that the particular interviewee was holding. Thus, the following interviews built on the previous ones and were adapted based

on the concerns of the interviewees. I did remain within the general themes I had planned to cover; however, the questions became context-specific depending on what was being said. Moreover, I felt that by letting go of the question-structure but keeping the conversation within the matter in hand, the interviewees opened up to me and were able to illuminate their concerns and values with what they said. Consequently, it became a combination of informal conversational and semi-structured interview that guided me through the interviews while leaving the conversation flexible and reflexive. (Patton, 2015)

5.3 Additional sources

In addition to the interviews, I got an opportunity to observe a meeting of the Environmental Committee of the Parliament where the national oil shale development plan that is about to be adopted, was being discussed. I was invited to attend by the interviewee of the Association of Estonian Mineral Resources (EMÜ), who I had interviewed as part of my research. In the Committee meeting I was observing as an intern of EMÜ, while the chairman of EMÜ had been invited to express his opinion about the oil shale development plan. The meeting lasted around 45 minutes and I was able to take notes about what the main topics of discussion were as well as what contradictions arose. However, at the meeting no final decisions were presented.

Furthermore, I was invited to join a 4-day trip to Ida-Virumaa to see various oil-shale related activities, facilities and the magnitude of environmental impacts of the oil shale industry, such as waste. The chairman of EMÜ found it important that I see the actual magnitude of the impact that oil shale has on the area, in terms of social as well as environmental consequences. I participated as a member of an investigative team, where three of the members were visiting to document the human-nature interaction for a photo exhibition in Venice. The chairman of EMÜ was the tour guide and I was participating as a student doing research. During the trip we visited many closed as well as active oil shale mines, and looked around the electricity power plant and a shale oil production site. Furthermore, we passed through small towns that were built for oil shale industry workers but with the closing of the mines have become empty. My material gathered during the trip stems from visual sensing of the surroundings, discussions held with other participants and photographs taken of the facilities and spaces that had come into existence as a result of the oil shale industry.

In addition to the interviews, participation at the meeting and the trip, I studied national media reporting, from newspapers and talk shows, which have also fed into my analysis of the Estonian energy discourse. The public media channels serve as a

forum for the debate, where the perspectives are negotiated. This makes it relevant to acknowledge public media channels as an additional source of information. It will complement my understanding about the various story-lines embedded in the energy debate in Estonia.

5.4 Analytical procedure

Data analysis in qualitative research is according to Patton (2015) like playing a game without explicit rules, but rather drawing a set for the game during the game. The handling of raw data means distinguishing the significant from the trivial and finding patterns to communicate. Even more, the idea is to process a large quantity of data to the essence of it. No step-by-step instructions exist for analysing, however guidelines are there to help an inquirer find its way. (Patton, 2015).

The grounded-theory approach, as described by Bernard (2006), is a toolkit for identifying the concepts that surface from the transcribed interviews and linking them into the formal theories. To a large extent the codes are given openly, without any particular theoretical pre-understandings in mind (Bernard, 2006). I used this approach to find patterns in my data.

First, all the interviews were transcribed, except for the pilot interview, as the latter was used in the preparatory stage of the research and provided a starting point for the subsequent study. The transcribing process enabled me to absorb the data again and spot some initially irrelevant-sounding utterances that revealed to be very valuable. I also made some notes during the transcribing process to note the emphasis in the interviewee's voice or to make notes about my own thoughts that emerged about what was being said.

Secondly, I started looking for potential analytical themes by coding. For that the meaning of each seemingly important utterance was given a code. Those codes were then re-organised and formed into categories. While doing that, I worked back and forth between the raw data and the codes, in order to make sure to consider the context of the utterance while categorising them.

In the third stage, I started to compare the perceptions of the actors within the different categories. I juxtaposed them against one another to illuminate the similarities and differences within the categories as well as how these perceptions relate and intersect. Herein, the story-lines and the discourse-coalitions started to emerge.

Finally, the focus was on how different perceptions affect the political response, what sort of story-lines and discourse-coalitions are present and how they struggle over the problem definition.

5.5 Limitations

As a researcher I am a part of the constructive process of building the understanding and illuminating connections. Thus, it is relevant to keep in mind that I have contributed with my personal perceptions and understandings, which enabled and limited me throughout the whole research process, from the development of the interview guide to the interpretative process of coming to understand particular patterns in a particular way. My understandings provide me with particular way of seeing things. This may be seen as a limitation in a sense that another researcher may not come to find the same patterns due to his or her different way of seeing things. For example, I value the environment and have become cognitively committed to any pro-environmental ideas, which suggests a particular pre-setting for defining and/or categorising the utterances, actors, and social order. However, I have tried to overcome that limitation by being transparent and clear about why and how have I come to my results and conclusions. Moreover, the consciousness about my own personal point of view has made me very careful during my analysis. Thus, I have focused on really getting the grasp of the "opposing" understanding by "stepping into their shoes".

Although I strived for representativeness while choosing the interviewees, a larger range of actors would have given a stronger foundation for drawing conclusions applicable for the whole sector. Further, as there is a large range of actors relevant to the Estonian energy sector, the involvement of representatives of private oil shale companies and small scale RE companies, academics, representatives of municipalities etc. could have provided a stronger basis for the conclusions. However, considering the given timeframe as well as my previous experience in conducting bulky qualitative research, it would not have been feasible.

Furthermore, the trip to Ida-Virumaa has affected my previous understanding about the county and the oil shale industry. Previously, I had perceived the oil shale industry to be a corner stone of the county, i.e. something the county's wellbeing is depending on, whereas now I rather see it as a reason for the poor conditions of the region. Abandoned villages, and towns covered with dust due to some mining related factories become the prevailing picture. And I must admit that it looked rather miserable. The interviewee of EMÜ as a tour guide took us to the places, s/he considered the most important in relation to the oil shale activities and these potentially were the most extreme sites. It is likely that there are places less miserable in the area; however, those areas potentially are also more distant to the oil shale mining and processing activities. Thus, as my personal construction of reality is likely to be biased by what I learnt during the field trip to Ida-Virumaa, I have forced myself to constantly question and critically examine my results. Yet, this has led to stress and a fear of under- or overestimating parts of my data. In order

to cope with this, I have continuously gone back and forth between my findings and my data. Moreover, I have looked for additional sources of information, such as media reporting or personal communications, in order to verify the validity of my interpretation. On the bright side, the risk of being biased has also increased my interest to really come to understand *all* the perspectives within this domain.

6 Struggle over the future of the Estonian Energy Sector

In this section the results of my analysis are presented in order to shed light on the perceptions that occur and prevail in the Estonian energy sector. My findings are categorised as sections of themes that reveal the presented story-lines.

The analysis of the empirical material shows that the different actors have divergent perceptions about the oil shale industry, renewable energy, the EU climate and energy policy, and their own role in the Estonian energy transition. As will be shown, some of the perceptions reveal contradictory stories about the same phenomenon. I contrast the differences and similarities found among actors' understandings and seek to expose the problem definition embedded in their presented story-lines. Story-lines unfold through the statements of the interviewees and reveal discourse coalitions as the actors present similar perceptions about the various phenomena.

6.1 Social importance of the oil shale industry in Ida-Virumaa: security or threat

Previous studies have shown that the Estonian energy discourse is largely affected by social concerns over Ida-Virumaa (Holmberg, 2008; Auer, 1998). Thus, it comes as no surprise that one of the key themes is the social importance of the oil shale industry, which is further related to national security.

Herein, the social importance is meant in relation to the employment and well-being in a particularly susceptible part of Estonia – Ida-Virumaa. Media reports reveal that a lot of jobs are related to the oil shale sector which in itself has a strong regional indication to Ida-Virumaa (Õhtuleht, 2014; Koorits, 2014).

Another issue that appears in the media reporting is the complex Estonian-Russian diplomatic relationship, which suggests that the sudden unemployment of the Russian-speaking population in Ida-Virumaa poses a security threat to Estonian sovereignty (Lakson, 2015). Herein, national energy production and security become intimately linked to national sovereignty and social security. To make an example, loss in the social security of Ida-Virumaa is seen to initiate protests and draw international, potentially Russian attention, which poses risks to national security. A reduction in energy security would equally diminish national and social security. Thus, energy security, national sovereignty and social security are central components of the Estonian energy discourse.

The social importance of the oil shale industry was a reoccurring theme also throughout the interviews. Four out of the six interviewees brought up the social importance in the context of energy production and oil shale industry. Two distinct

understandings about the social importance were presented that indicate two different trajectories for the energy transition. However, both indicated trajectories are perceived sufficient for meeting the EU climate and energy objectives. The difference of the trajectories rather remains in the distinct presentation of the social concerns over Ida-Virumaa that illuminates contrasting problem definitions.

The social importance of the oil shale industry in Ida-Virumaa becomes a central part of the story-lines around distinct pathways for the energy transition. Firstly, the oil shale industry is presented indispensable due to the employment it provides in Ida-Virumaa through processes of mining and processing of the oil shale. Thus, high importance is placed on the industry and its capability to operate in Ida-Virumaa. This common understanding is expressed by the interviewees of KKM and Nelja Energia.

Similar understandings are reflected in recent governmental initiatives, such as the decision of the Estonian Government to ease the burden on the oil shale industry by temporarily reducing environmental taxes on oil shale. The decision aims to avoid the social catastrophe in Ida-Virumaa that is projected to happen as a result of the shutdown of the oil shale industry. As no alternative solution is perceived to exist, the interviewee of KKM explains:

> *"… it is done based on very clearly understandable political decisions. Let's be honest, none of us wants to see a massive crisis happening in Ida-Virumaa, right. Well, that is clearly a supportive measure."*
>
> *["see on väga selgelt tehtud väga arusaadavatest poliitilistest otsustest lähtuvalt. Noh tegelikult, olgem ausad, ega keegi meist ei taha näha, et seal Ida-Virumaal mingi suur kriis tuleb, onju. Noh, et see on väga selgelt toetav"]*

A similar perception of social importance of the oil shale industry was presented by the interviewee of Nelja Energia:

> *"… well, I say, the social aspect is so huge there that it would cause a social catastrophe if we shut down the oil shale in Ida-Virumaa."*
>
> *["noh, ma ütlen, sotsiaalne külg on nii suur seal taga tegelikult, et tekitab lausa sotsiaalse katastroofi kui Ida-Virumaal nüüd sulgeda põlevkivi pool"]*

Namely, the interviewee of Nelja Energia claims that oil shale companies (Eesti Energia in particular) simply cannot switch to renewable energy sources because of

the social responsibility they bear, since renewable energy would not create even closely as many jobs. It becomes clear that this way of seeing indicates to the 'either or' choice between environmental and social benefits. Herein, the trade-off assigns more weight to the socio-economic argumentation.

Holmberg (2008) has argued that the shutdown of the industry and the consequent rise of unemployment among the marginalised Russian-speaking population in Ida-Virumaa is likely to draw unwanted international attention on Estonia and cause accusations of discrimination towards the Russian minority. Perceiving the oil shale industry as fundamental for the employment in Ida-Virumaa through the national security frame, is continuously reconstructing the need for oil shale mining and processing. Thus, the fear of international reaction helps to maintain the industry (Holmberg, 2008), and to encourage to look for modifications of the existing technologies, in order to simultaneously cope with the social and environmental concerns.

Interestingly, the interviewee of MKM as well as the interviewee from EE does not bring up the importance of the oil shale industry in providing jobs or influencing the well-being of Ida-Virumaa. The words "social responsibility", "Ida-Virumaa" or any other signs to the particular theme were not brought up in either of the interviews. Nevertheless, the future pathway for energy production, as advocated by the interviewees from MKM and EE, indicates to the social importance of oil shale industry in Ida-Virumaa. Both of the interviewees speak in favour of the increased share of biomass, i.e. timber and other forest products, for energy generation in Ida-Virumaa. Such presentation, however, can be seen as an alternative solution for the employment situation in Ida-Virumaa, whereby jobs would be created in the forest sector. Partially substituting oil shale with biomass is presented as a win-win solution to Ida-Virumaa also by the media due to the job creation in the forest sector (Õepa, 2016). Yet, environmental organisations have strongly criticised the proposal as risking the sustainability of Estonian forests.

Thus, it appears that the interviewees of KKM, MKM, EE, and Nelja Energia cognitively share the understanding about the oil shale industry as being essential for Ida-Virumaa and national security.

Second, the interviewees of EMÜ and ELF (ENGOs) perceive the well-being of Ida-Virumaa as a reason for phasing out the oil shale industry. The interviewee of EMÜ presents crises as a consequence of placing oil shale industry central for the employment of Ida-Virumaa:

> *"… well, for example, the socio-economic problems presently occurring in Ida-Virumaa... they can only become sharper. In terms of businesss, things are becoming more complicated, similarly in terms on environment, because… all or let's say the majority of*

the oil shale that is easily accessible and that has a high energy content per square meter… the majority of that oil shale has already been extracted."

["noh, näiteks need sotsiaal-majanduslikud probleemid, mis on täna näiteks Ida-Virumaal, need saavad minna ainult teravamaks, ärilises mõttes läheb asi keerulisemaks, keskkonna mõttes samamoodi, sest kõik või no ütleme enamus sellest põlevkivist, mis on lihtsasti kättesaadav ja mille energiasisaldus on suurt niiöelda ruutmeetri kohta, enamus sellest kivist on tegelt täna juba välja võetud".]

It is presented as necessary that oil shale gets decoupled from both the energy system and from Ida-Virumaa in order to increase national and energy security, which currently rely on volatile oil and electricity prices. Such concerns were expressed by the environmental organisations during the meeting of the Environmental Committee of the Parliament, as they highlighted that the content of the discussed Estonian Oil Shale Strategy is outdated in light of changed base-conditions such as global oil prices or the Paris agreement.

So, it appears that the reliance on the oil shale industry is presented to pose a security threat. As long as oil shale is central for Ida-Virumaa and the Estonian energy system economy, national security remains at risk, because the electricity market and global oil prices that keep the industry going, are volatile and beyond control.

Thus, Ida-Virumaa is unequivocally perceived to be dependent on oil shale based energy production, whereas such dependency paradoxically is presented to both pose a security threat and ensure national security. Such presentation divides the actors into two different discourse-coalitions that indicate to two different story-lines in relation to the energy transition pathway (see figure below).

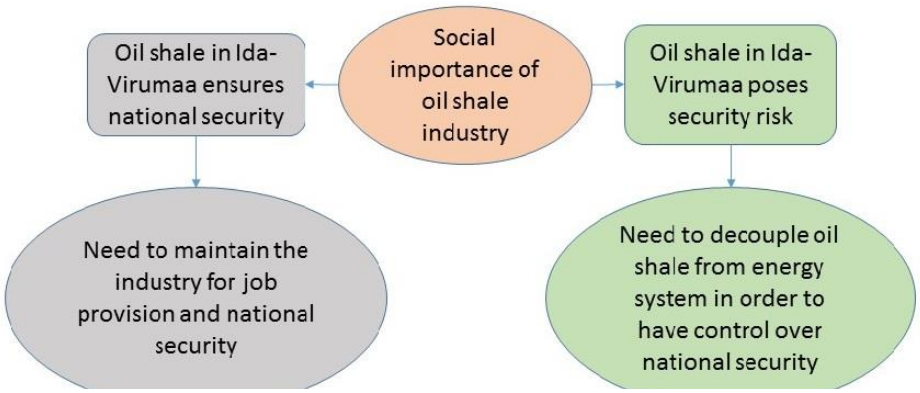

Figure 5. Simplified drawing of the perceptions on the social importance that suggests specific energy transition pathways for Estonia (own production, 2016)

The interviewees of KKM, MKM and EE share a common view about the importance of the oil shale industry for the people of Ida-Virumaa and for national security. This story-line refers to the necessity of the oil shale industry for Ida-Virumaa and bounds the actors into a pro-oil shale discourse-coalition (Hajer, 1995). Contrarily, the interviewees of ENGOs consider the social importance of the oil shale industry to pose as a threat to national security. Thus, their presented story-line, which implies a shift away from oil shale, use in either electricity, heat, or shale oil production, ties the ENGOs into an anti-oil shale discourse coalition. Similar counter-representations are revealed from a study on shale gas, as the security and threat also become apparent in the energy discourse in the UK (Jaspal and Nerlich, 2014).

The interviewee of Nelja Energia, however, has adopted and employs a story-line that sounds right for him/her personally without aiming to impose it on others. S/he does not promote a particular way of seeing, rather s/he gives sense to the persistence of oil shale in the energy system. Yet by doing so, s/he upholds the discursive order and reproduces the pro-oil shale discourse-coalition.

The opposing perceptions about the essence of the social importance of the oil shale industry imply radically different pathways for energy transition. Such dualism will continue to be present also in the following themes.

6.2 Market based approach vs. public policy

The second key theme encompasses the description of a favourable approach towards the energy transition. The words "market" and "competitiveness" occur rather often in the interviews, thereby indicating the importance of economic development in the energy sector. In presenting the favoured transition pathway the description of a liberal EU-wide market is contrasted with national energy policy developments.

According to the interviewee of MKM, Estonia is a liberal market economy, where the policy choices are shaped by supply-demand dynamics. As minimum state intervention is presented as being wise, the subsidies to promote RE are seen as unsustainable. That is stated by the interviewee of MKM:

> *"I think that this kind of environment, where each member state sets its own targets and then goes all the way to meet these objectives and pays out subsidies for those purposes... In my opinion, this is not a sustainable model for EU."*
>
> *["Mulle tundub, et nagu selline keskkond, kus iga liikmesriik seab endale mingisugused eemärgid ja hakkab neid palehigis täitma ja*

selleks maksab nagu toetusi.. et ma arvan, et see ei ole nagu jätkusuutlik mudel Euroopa liidu jaoks."]

Thus market based solutions are presented as sustainable while subsidising is perceived unsustainable. The interviewees of MKM and KKM suggest that EU climate and energy policy objectives, also including those in Estonia, can and must be achieved through an EU-wide market driven mechanism, the EU Emission Trading System[3] (ETS). Although, the current CO_2 price is acknowledged to be too low to facilitate the EU-wide emission reduction, the interviewees of KKM and MKM remain rather consistent that ETS must be the common measure for the common goal, i.e. for EU-wide GHG emission reduction, which is seen as the main aim of EU energy and climate policies. The EU is thus perceived as being responsible for establishing the functionality of the ETS if it sought to meet its goals. The confidence of the interviewees of MKM and KKM in ETS is possibly affected by two factors. Firstly, Estonia has overachieved its GHG emission reduction and RE objectives. Secondly, further effort on a national level also remains questionable due to the uncertainty in relation to the EU policies after the year 2020. These factors indicate no urgency for structural changes, as Estonia is not in any hurry to further reduce its emissions. With a given timeframe, the ETS would be intensified, if the EU was serious about its long term objectives.
Moreover, the confidence in ETS is illustrated in the ENMAK where it has been given a rather important role. The interviewee of KKM states:

"We see definitely that climate politics on the EU-level should be based on a common view and the ETS should be the main tool that affects it. So based on all the predictions… ETS price projection, development plans of the [oil shale] industry itself... well, I personally do not see any insurmountable issues in achieving the -80%."

["meie näeme kindlasti, et kliimapoliitika peaks olema sellise ühise vaatega Euroopa tasandil ja siis see ETS peaks olema nagu peamine tööriist, mis seda nagu mõjutab. Et noh et lähtudes kõikidest prognoosides.. ETSi hinnaprognoosidest, tööstuse enda arenguprognoosidest, meie nagu praegu, noh, mina isiklikult ei näe nagu mingit ületamatut probleemi selle -80% saavutamises."]

It appears that the EU objective of reducing the GHG emissions is perceived to pose

[3] ETS is an auctioning system for emission allowances in the EU and is emphasised as important measure for energy sector in the transition to low-carbon economy. (European Commission, 2016)

no challenge. Thus, market-led approach is promoted not only as sustainable but also as a reasonable way to facilitate the energy transition. As the current achievements of Estonia are in line with the EU objectives, there is no pressure to enforce large changes neither in the existing political nor technological system. The flexibility left by the market based approach enables the state to intervene if it is necessary to fulfil the EU obligations. Thus, the future RE and GHG reduction targets are expected to be achieved through market based solutions on the EU level. Yet, researchers such as Verbong and Geels (2007) consider energy transition unlikely under the conditions of liberalisation and Europeanisation, especially with the low profile of environmental concerns. Contrarily, Markard and Truffer (2006) see liberalisation as a driver for innovation.

Further, the market approach enables Estonia to continue the utilisation of oil shale, thereby letting the state profit and gain return from the large investments recently made in EE electricity production. The wish to exploit the existing infrastructure and know-how is also indicated by the interviewee of EE:

> *"And to some extent we are looking at the present day, /.../ what kind of production basis we already have. How, then, first of all, to make maximum use of the existing resource base and fit it then into the picture"*
>
> *["Ja no mingil määral me vaatame ju tänast päeva, milline tootmisbaas meil on, milline see ressursibaas meil täna olemas on. Kuidas siis kõigepealt siis seda ressursibaasi maksimaalselt ära kasutades sinna pilti muganduda."]*

Expectations that the investment would pay off constitute a strong incentive for the state, as the owner, to sustain oil shale (energy production capacities) instead of choosing the alternatives. However, the technological modification that the oil shale industry is anticipated to go through in order to fit the market can be seen to further deepen the lock-in of the oil-shale based technologies. Lock-in means that a current technological direction (or pathway) becomes more persistent and difficult to be altered by alternatives (Holmberg, 2008). Thus, the market based approach can be seen to continuously sustain the existing energy system, which consequently forms a major limitation for radical changes in the energy system.

The ENGOs, however, seek structural changes in the energy system achieved through policy making, which is seen to require strategic political intervention. According to the interviewee of ELF:

> *"/.../I think that energy sector needs structural changes in order to not to depend on fossil fuels. And coming up with such JOKK-*

schemas [4]does not help to facilitate that structural change, rather it keeps us in the old system as long as possible."

["mulle tundub, et energia sektor vajab struktuurseid muutusi selle jaoks, et mitte sõltuda fossiilsetest kütustest. Siis selliste JOKK skeemide väljamõtlemine ei aita nagu seda struktuurset muutust läbi viia vaid hoiab veel meid selles vanas süsteemis nii kaua kui võimalik"]

The interviewees of EMÜ and ELF criticise the market based approach and the JOKK-schemas as those are seen to be "picking the lowest fruits". Such a 'no-vision-approach' is seen to put the energy sector in a very bad position at some point in the not so distant future. Similarly, Kern et al. (2008) found that some actors in the Netherlands perceived the indecisive liberal approach to be reducing the reliability of the Government as a partner. Yet, the flexibility left by the government in the Netherlands aimed to prevent the lock-in of prematurely chosen technologies (Kern and Smith, 2008). However, in Estonia, the flexibility left by the government allows the oil shale industry to gradually adapt to the tightening external pressures. The latter becomes further evident from the meeting of the Environmental Committee of the Parliament, where the representative of KKM[5] claimed that the current Oil Shale Strategy includes flexibility in order to respond to the demands based on the economic and global situation. Herein, the flexibility enables both the state and the oil shale sector to follow the trends and respond to pressures on an ongoing basis.

Further, the ENGOs see the potential of Estonia becoming a pioneer in greening the economy in EU, but the market based policy approach is perceived to leave that potential unemployed. Lack of political will and the dominance of the industry in the discussions are presented as the reasons for such inadequacy. The interviewee of ELF states:

"/…/ we feel that the force of the industry is so strong… that, even if during the Environmental Committee meeting we come to the stage where the parliament members say that, yeah, we understand your point of view… yet the decisions that come out of the parliament is something different."

["me tunneme, et see tööstuse jõud on nii tugev. Et isegi kui me jõuame riigikogu keskkonna komisjonis mingil arutelul sinna, et

[4] JOKK translates to „legally, all is correct"
[5] Different person than the interviewee of KKM

üldiselt riigikogu liikmed ütlevad, et jah, saame teist aru, siis see otsus, mis sealt lõpuks tuleb on ikkagi nagu teistsugune"]

Thereby, the ENGOs show little belief in the capability of the current political order to facilitate the structural change, as the industry lobbyists are seen to have greater impact on the decision making. Alike, the incumbent energy companies, understood as fully-developed companies that have technologies, competence, and infrastructure in place that fits the existing regulation, were found dominant in designing the energy transition pathway also in the Netherlands (Kemp and Loorbach, 2005; Kern and Smith, 2008). Kern et al. (2008, p. 4101) notes that the dominance of incumbent actors "risks incremental innovation rather than contributing to structural change". The risk becomes visible also in the Estonian energy discourse, where modifications in the existing energy system are favoured by the governmental and oil shale industry actors rather than encouraging innovative technologies and RE.

Moreover, dis-encouragements for RE developments are described by the interviewee of Nelja Energia, as s/he claims that the current regulative environment is unstable and thus limits the establishment of new power capacities. Similarly, the Dutch RE policy was criticised for being unstable and reducing the certainty and interest of investors. (Kern and Smith, 2008) Further, the demand for RE in the Estonian electricity market is possibly limited due to the burden of the RE subsidy that is placed directly on the consumers, adding an extra line of costs. The consumer thus bares higher costs when choosing RE compared to the electricity from non-renewable sources. That is likely to reduce the demand for RE among cost-sensitive consumers. With the perceived uncertainty in domestic regulation and low demand, the interviewee of Nelja Energia describes how the company has set its focus on other EU countries:

"Our message is that the green energy must be sold to Europe. As Europe today has not filled those green… those 2020 targets."

["meie sõnum ongi see, et tulebki seda rohelist energiat Euroopasse müüa, et Euroopal on täna need rohelise... niiöelda 2020 eesmärgid täitmata"]

Thus, the market based approach opens an EU-wide market where the demand is higher. As wind conditions are claimed to be very good in Estonia, Nelja Energia seeks to build further capacities in Estonia in order to sell the electricity elsewhere. Evidently, the market based approach provides a market for Nelja Energia services. The practical arrangements that would enable the functioning of the Cooperation Mechanism are yet to be entered into Estonian regulation. However, it is likely to

be finalised in the near future, as the Cooperation Mechanism has already found its place in the ENMAK.
Further, the interviewee of Nelja Energia perceives a strong market advantage in the production of green energy, saying:

> *"/.../if you cover the maintenance costs that means that the windmill can operate as it is maintained, then all the money that is gained beyond that starts covering the investment. So... others have to additionally cover the fuel-component. In that sense windmills have a definite advantage."*

> *["et kui tuulikul sa suudad hooldukomponendi ära katta, siis tähendab seda, et tuulik võib ringi käia ja ta on niiöelda hooldatud. Ja igasugune raha, mis sealt edasi tuleb juba hakkab seda investeeringut katma. Et.. siiski ta noh.. kõigil teistel on.. tuleb see kütusekomponendi võrra koguaeg hiljem. Et sellevõrra on tuulikul kindel eelis."]*

The interviewee explains that fuel-free energy sources can enter the electricity market earlier, at a lower price, since the electricity market-price has to cover the maintenance costs only. Oil-shale-based electricity may enter later, with higher price, as it additionally has to cover the costs for input materials, either biomass or oil shale itself. Herein, the interviewee of Nelja Energia upholds the story-line of ENGOS that sees RE as more competitive compared to oil shale (or other fuel) based energy.
Thus, two distinct story-lines can be seen to emerge through the different descriptions of reality. The difference between the story-lines lies in the issue whether the energy transition should be led by the market or by purposeful and systematic politics. These story-lines mobilise the actors in two separate discourse-coalitions. The anti-oil shale discourse-coalition, i.e. the ENGOs promote the story-line that perceives political intervention to be essential for the energy transition. Contrarily, the pro-oil shale discourse-coalition, i.e. the governmental and industry actors pursue the story-line that relies on market based solutions. The interviewee of Nelja Energia, again, remains aside from the discourse-coalitions, as s/he purposefully promotes neither of the story-lines. Yet, by adopting them s/he reconstructs and upholds both of the story-lines and discourse-coalitions.
Further, the dichotomy among the actors begins to illuminate that the energy transition is understood quite differently by the two discourse-coalitions.

6.3 RE vs. oil shale – innovation vs system improvement

The third theme builds on the actors' description of RE and oil shale. The characterisation of RE and oil shale reveal the perceived meaning of the energy transition among the discourse-coalitions.

First, the pro-oil shale discourse-coalition states that in the long run a credible energy company must be able to compete in fair market terms. However, RE is perceived to continuously require financial support in order to operate. The description of RE as uncompetitive becomes instrumental in positioning the existing oil shale-based energy as more competitive and thereby also as a more credible source. Thus, the 'competitiveness' is used in order to frame oil shale-based *versus* renewable energy as the competitive *versus* uncompetitive, revenue *versus* expense. Those descriptions are employed to enhance the general acceptability of the two alternatives and to gain support for the current policy developments that have shown support towards oil shale industry. Presenting RE companies as depending on and craving for subsidies reduces the accountability of those technologies and increases the accountability of the existing energy system. Controversially, the interviewee of Nelja Energia claims instead that the oil shale sector is currently being nurtured by the state, although for understandable (socio-economic) reasons.

Besides the competitiveness, technological descriptions are employed by the pro-oil shale discourse coalition. Technological modifications to the existing energy system are seen as sufficient for meeting the EU energy and climate policy objectives. The mixing of oil shale and biomass for electricity purposes and reorienting the oil shale industry from electricity generation to oil production, i.e. the 'system improvement' is also referred to by the interviewee of EE:

> *"We do not propose any energy revolution. Rather we talk about the reasonable utilisation of the lifetime of the existing units and improving them in order to reduce the environmental footprint".*
>
> *["Niiet ega sellesmõttes me mingisugust suurt energiarevolutsiooni välja ei paku. Pigem me räägime täna ikkagi tehtud investeeringute eluea ära kasutamisiest võimalikult mõistlikult, nende täiustamisest, ikkagi selles suunas, et see keskkonna jalajälg oleks võimalikult väike"]*

Moreover, the future of the oil shale industry is presented as promising by the interviewee of KKM. S/he claims that the industry itself shows strong initiative in reducing its environmental footprint and therefore complying with the EU requirements. Reorienting from direct combustion to oil production and modifying existing technologies to further reduce emissions are perceived as a great effort and are thus appreciated and encouraged. Both of the governmental actors note that shale

oil export is a great measure in reducing Estonian carbon footprint, as the emissions are accounted for in the importing country. Thus, the 'system improvement' planned by the oil shale industry is presented not only as sufficient, but also as an opportunity to lengthen the value chain and provide higher economic benefits for Estonia. As a result, there is no need for the state to interfere in the transition to low carbon economy. Accordingly, the interviewee of KKM says:

> */.../ well, in order to indicatively meet the [EU] objective, we do not have to shut down the oil shale industry. And we don't even have to show this direction, because by the end of the day, the market will determine… "*
>
> *["et noh, jõuda indikatiivselt selle eesmärgini, me ei pea põlevkivi tööstus kinni panema. Ja me ei pea nagu isegi andma seda suunda, et lõpuks turg määrab ära"]*

Paradoxically, with the recent decline in the global oil price and the low electricity price, the market is not allowed to determine. Instead, the state plans to implement nursing measures to help the oil shale industry cope with the market fall. As noted in the introduction, the Estonian government decided to reduce the environmental taxes in order to support the oil shale industry during these difficult times.
The development pathways of the industry, however, are presented to be dependent on the decisions of the state according to the interviewee of EE:

> *"…we hold the view that as long as Estonian government has a plan to utilise its resources… well, if at some point the government says that they do not want to do it anymore, then fine, no reason to be stubborn and immensely hold on to it."*
>
> *["Et noh, me oleme ikkagi seisukohal, et niikaua kui Eesti riigil on plaan oma ressursse kasutada… noh kui Eesti riik ütleb mingil heal hetkel, et ta ei taha seda enam teha, fine, ega siis jälle jonnida ei ole ju mõtet, et millestki nagu tohutult kinni hoida."]*

Herein, the company representative claims to only follow the command of its owner who has chosen to promote technological modifications. The focus on the 'system improvement' can be explained by the fact that the state has defined the oil shale as a national treasure:

> *The interest of the state is the efficient and economical utilisation of oil shale as a national wealth. In carrying out the states' interest environmental, economical, security, social and demographic (regional) objectives and risks have to be considered*. (The

Ministry of the Environment, 2014)

Based on the description of oil shale as a national wealth, the importance of oil shale becomes particularly persistent in the energy discourse through the practice of EE, as the interviewee of EE states:

> *"Eesti Energia operates based on the objectives set by the owner that is the Estonian state. We have them in principle on written form. These objectives are, just as for any business, to produce profit for the owner, we must fully valorise Estonian natural resources, specifically oil shale, but also others. Environmental damage should be as low as possible, and generally it should be reduced. And, of course, we must continuously ensure competitiveness on the market."*

> *["ega Eesti Energia toimib tegelikult ikkagi lähtuvalt tema omaniku ehk Eesti riigi poolt talle ette pandud eesmärkidest. Need on nagu meil sellemõttes põhiliselt kirjalikult täiesti selgelt olemas. Nendeks eesmärkideks on loomulikult, nii nagu ettevõtlus, peame me kasumit tootma oma omanikule. Me peame Eesti loodusressursse, siin peetakse silmas küll põlevkivi, aga ka muid ressursse võimalikult maksimaalselt väärindama. Keskkonnamõju peaks olema võimalikult minimaalne, seda üldjuhul peaks nagu vähendatama. Ja no loomulikult konkurentsivõime tagamine jätkuvalt, kogu siin turul"]*

Although, the company operates on behalf of its owner, the interviewee of EE presents a range of limitations and constraints that are related to a shift to alternative (i.e. RE) energy sources, which indicate scepticism. Due to the close relationship between EE and the state, the scepticism is likely not unique for the representative of EE. Consequently, RE becomes painted as a complicated alternative also concerning technology, while oil shale-based energy has proven to be a stable and reliable source for electricity and income. Based on the sayings of the interviewees, the oil shale industry appears dominant in shaping the future of the energy sector in Estonia.

Moreover, the RE-supporting actors are presented to only care for subsidies by the interviewee of MKM, who describes the 'interest groups' to be showing low interest in substantive discussions and participating only if there is a chance to get subsidies. Thus, those interest groups are perceived to lack credibility also in meaningful discussion. Furthermore, the imbalance in decision-making is supported by the sayings of the interviewee of KKM. The interviewee presents much knowledge about the oil shale industry by describing their planned technological developments in great detail, whereas the concerns of the RE companies remain rather unfamiliar. Previous studies on energy transition have also found incumbent energy companies

to be dominating the energy transition, if is not deliberately balanced. (Kemp and Loorbach, 2005; Kern and Smith, 2008)

Second, the view held by the anti-oil shale discourse coalition characterises RE and oil shale rather differently. In contrast to the pro-oil shale discourse coalition, anti-oil shale discourse coalition considers RE as more advantageous compared to oil shale. RE is presented as taking over the market, since the transboundary networks are perceived to favour the decentralised generation of RE. The interviewee of EMÜ states:

> */.../electricity market, the grid connections we have with Scandinavia already work against the idea of burning oil shale. This year, connections with Lithuania and Sweden will be completed, in other words, soon Lithuania does not want our oil shale energy either. What's more, the Lithuania-Poland connection will be established shortly, which will further decreases the volume of Estonian oil shale electricity that can fit the market."*
>
> *["elektrienergia turul, need ühendused, mis meil Skandinaaviaga on, praegu juba töötavad väga selgelt vastu sellele, et põlevkivi ahju ajada. Et tulevad nüüd selle aasta jooksul saab valmis Leedu ja Rootsi ühendus, ehk et Leedu ka ei taha enam meie põlevkivi energiat varsti. Saab varsti valmis Leedu ja Poola ühendus, mis veel vähendab nagu seda, palju Eesti põlevkivi elektrit turule mahutab."]*

This indicates to the Markard and Truffer (2006) presentation of liberalisation, where it is seen to stimulate innovation and weaken the existing energy companies. (Kern and Smith, 2008) Further, a world-wide technological shift towards RE is predicted to gradually phase out fossil based energy solutions. Consequently, the world-wide energy transition poses a threat to the current Estonian energy system. If changes are not planned and implemented, the major Estonian energy company, as well as the energy and oil shale sectors is predicted to end up in a very difficult situation. Thus, the anti-oil shale discourse coalition representation of the RE and oil shale pursues 'system innovation'. By focusing on RE and externalising oil shale from the energy system, the difficulties of Estonian energy and oil shale sector could be prevented.

Interestingly, oil shale based energy is described as a precondition for RE by the interviewee of EE:

> *"If each RE company, especially wind power companies, today had an obligation to set up supportive capacities to cover peaks and gaps, I think we would not have those windmills in place today."*

["kui tegelikult täna peaks iga taastuvenergeetika ettevõte, eriti just tuule-energeetika ettevõte hakkama ise püsti panema mingeid kompenseerivaid võimsusi, siis ma arvan, et meil ei oleks ka neid tuuleparke täna"]

With a sensed heroism in the latter saying, EE activities are presented to enable the operation of RE companies in Estonia. Fossil-based energy is thus seen as a pre-condition for RE development. This further reconstructs the importance oil shale-based electricity production, even in relation to wind power production. Interestingly, also the interviewee of Nelja Energia presents a similar understanding of RE. S/he says that presently RE is incapable of fully substituting oil shale in the energy system and that the demand peaks *should* be covered by some fossil-fuel based alternative, such as oil shale. The latter presentation upholds the necessity of the oil shale based technologies, but may easily be altered by innovative technological solutions, such as technologies for energy accumulation.

Herein, the story-lines that emerged from the sayings of the interviews reveal contradictory positions for the RE and oil shale based energy and thus indicate different understandings about the energy transition. The story-line presented by the pro-oil shale discourse-coalition perceives 'system improvement' suitable for the energy transition, which is understood in relation to the EU GHG emission reduction objective. Contrarily, according to the story-line presented by the anti-oil shale discourse coalition, 'system innovation' is essential for the Estonian energy transition that is characterised by innovative RE technologies.

7 Discussion

Although, the EU climate and energy policy objectives can be described as a symbiosis between economic and environmental developments, it turns out to be challenging on a national level. The implementation of the EU climate and energy policies in Estonia is accompanied by contested perceptions about the future of the energy sector. The multiple visions that emerge from the Estonian energy discourse through the story-lines pursue the legitimisation of a particular pathway for the energy transition. Moreover, those pathways inherently contain trade-offs between the environmental, social, and economic development goals, as noted by Beck (1994).

In the following section the story-lines that emerged from the analysis will be discussed in relation to the Estonian energy transition.

7.1 Alternative pathways for the Estonian energy sector

The argumentative discourse analysis revealed story-lines that encompass the descriptions on how the future energy production would look like, why energy transition is important and how to achieve it. As such, the story-lines reflect two distinct pathways for the energy transition in Estonia. I refer to them as *'strategic greening'* and *'pragmatic flexibility'*.

First, *'strategic greening'* aspires for environmentally friendly and sustainable energy production, where RE sources gradually substitute the oil-shale-central energy system. It implies a need to turn away from extensive extraction and utilisation of oil shale for energy purposes, either it is electricity, heat or oil production. Developing an energy system that is independent from oil shale was seen necessary for several reasons. First, fossil fuels must be decoupled from the wellbeing of Ida-Virumaa in order to prevent crises in the region and maintain national security. Second, the oil shale based major domestic energy company, EE, must be encouraged to redirect to sustainable sources in order to remain competitive on the transboundary electricity market. And third, the oil shale sector, as a whole, must be redirected from electricity and oil production to more valuable (chemical) products in order to successfully withstand the tightening climate change and market pressures. Such reasoning illuminates how environmental interests are disguised by presentation of concerns over social and economic development.

The *'strategic greening'* implicitly prioritises purposeful development of domestic RE energy sources. Yet, it does not imply an urgent radical change, rather, it emphasises the *managing* of the energy system. Letting go of the market based

approach and taking control over the energy system, regional development and national security are seen essential for the sake of economic and social development. Particularly, as the shift from fossil fuels to renewable sources is perceived to be happening in the world. Therefore, the market based approach is perceived to embody uncertainties and risks for the oil shale sector, and the Estonian economy and sovereignty. Consequently, it becomes a matter of controlling the situation versus being led by external forces.

Second, *'pragmatic flexibility'* describes the energy transition pathway as a reflection of the EU requirements, according to which the current system would be modified. On this pathway, the oil shale industry is considered to be important because of the economic and social benefits it entails. First, the oil shale industry is seen to safeguard the well-being of Ida-Virumaa and consequently the national security of Estonia. Second, oil shale is characterised as a national treasure and is thus essential for the Estonian economy in comparison to the economic potential of RE. Thereby, from all the possible solutions for meeting the EU objectives, the ones least damaging for the oil shale sector should to be chosen. Thus, the market based approach is perceived to be suitable to facilitate the transition. '*Pragmatic flexibility'* sees EU-wide market mechanisms as fundamental for the EU to meet its objectives, wherein the responsibility for the functionality of the ETS lies with the EU institution. On a national level no energy source should be given market advantage and energy transition should be shaped by market demand. In Estonia that would enable the existing energy system to adapt to the changes and meet the EU GHG emission reduction objective through system improvement. Consequently, the '*pragmatic flexibility'* transition pathway promotes the EU-wide market, while emphasising the national importance of the oil shale industry for economic and social reasons. Therefore, the environmental concerns and climate change would be considered insofar as they were required by the EU regulation.

Thus, it appears that energy transition is interpreted in two distinct ways. On the one hand, energy transition implies to the contents of the Low carbon economy Roadmap that emphasise the encouragement of innovation and green technologies. On the other hand, energy transition is understood as meeting the EU low carbon economy numerical objective of reducing the GHG emissions by 2050.

The story-lines have bound together two discourse-coalitions. First, KKM, MKM and EE were found to form the pro-oil shale discourse coalition through the presentation of the 'pragmatic flexibility' transition pathway. Second, EMÜ and ELF presented the story-lines jointly are called 'strategic greening', formingthe anti-oil shale discourse coalition. Markard et al. (2016) found a similar dichotomy among the coalitions in Switzerland, where the 'pro-economy' coalition opposed the regulatory intervention and the 'pro-ecology' coalition sought for public policies that would consider environment and climate change. As in the pro-oil shale

discourse coalition, the pro-economy coalition included governmental and industry actors, while environmental organisations similar to EMÜ and ELF were found in the pro-ecology coalition (Markard et al., 2016).

Besides the story-lines, the discourse-coalitions are also bound together through collaboration and their practices. Those practices however entail structures that both enable and constrain them. The close relationship between EE and the state, for instance, is likely to constrain the externalisation of oil shale from the energy system. As oil shale is perceived as an important source of income for the state, EE is encouraged to improve its technologies in order to make the maximum profit. The company advances its competence and technologies, thus further assigning economic importance to the oil shale, while the alternative energy sources become more distant and unattractive. Subsequently, a certain discursive cycle takes shape that further reconstructs and deepens the positioning of oil shale in relation to alternative energy sources. Moreover, the technological modifications conducted by EE to reduce the carbon footprint and increase economic efficiency additionally increases the lock-in of the existing energy system (Holmberg, 2008). Such interdependency between the state and EE can be seen giving persistence to the discourse coalition and their shared perceptions about the world, where oil shale is seen as lucrative.

Moreover, the strong focus of the Ministry of Economic Affairs and Communications (MKM) on economic development also translates into the practice and understanding of the Ministry of Environment (KKM). From the interview it is revealed that the interviewee of KKM showed a lot of support towards MKM. Potentially, the argumentation of MKM sounds right to the interviewee of KKM as the Estonian GHG and RE objectives have already been met with no substantial state intervention.

The only individual actor, Nelja Energia, does not seek to legitimise any particular line of argumentation, but interprets, adapts, and thereby reconstructs both discourse-coalitions and their story-lines. As the interviewee of Nelja Energia does not refer to any environmental aspects, the company is driven by economic incentives to provide green energy for Europe. The problem of an unstable regulative environment in Estonia is thus compensated by the EU market. Nelja Energia, who dangles between the two story-lines and discourse-coalitions, also reconstructs the competitiveness of the RE. Such enlargements of RE technologies are endorsed by the anti-oil shale discourse coalition and presented as evidence in the rise of renewable energy. Such expansion of niche-innovation, however, may turn out to be crucial for the energy transition pathway, as noted by Geels et al. (2007).

Thus, the energy discourse in Estonia can be considered hegemonic (Hajer, 1995). The first precondition, the discourse structuration, becomes evident as the anti-oil

shale discourse coalition frames their viewpoints through social and economic benefits. They have adopted the "rules" of the discursive "game" as they employ the prevalent terms and concepts, such as market and competitiveness, in order to impose their reality on others. Using more value and nature based concepts, which are potentially more customary to their practices would place them out of the "game". Thus, the structuration of the discourse is manifested in the terms and concepts inherent in the story-lines presented by the dominant anti-oil shale discourse-coalition.

Second, the discourse institutionalisation becomes evident as concepts such as ETS, competitiveness, or energy security have entered the national legislative framework in the form of ENMAK. Thereby, the market-based approach and the importance of oil shale become prevailing in the subsequent energy policies in Estonia.

Consequently, although, the perceptions and presentations of the various phenomena formed rather opposing images about the future of the energy supply, the discourse can be seen to be dominated by the pro-oil shale discourse coalition's conceptualisation of the problem and the solution.

7.2 Implications of the Estonian energy discourse

As argued by Hajer (1995) and noted by Markard et al., (2016) the definition of the policy problem in relation to energy transition is highly contested. This is supported by my findings where the future of the energy sector in Estonia is described quite differently by the actors. According to Kemp et al., (2007) the multiplicity of perceptions among actors is one of the key problems for change management. Yet, the energy policies are the result of the struggle between various actors who seek to legitimise their understandings of a problem. Thus, the dynamics of the discursive struggle have an essential role in shaping the energy transition in Estonia. In particular, the dominant problem definition becomes to shape the transition pathway in its political response.

Cotton et al. (2014) found that in the UK the fracking discourse was dominated by economic considerations that overlooked environmental concerns. The various perceptions about fracking had little impact on the dominant story-line that was presented by the industry and governmental actors (Cotton et al., 2014). Based on my findings, it appears to be similar in Estonia. The energy discourse is currently dominated by the perceptions presented by the governmental and industry actors. As the pro-oil shale discourse coalition perceives great value in the oil shale industry it supports the development and adjustment of the existing energy system in order to cope with the landscape pressures, to borrow Geels et al. (2007) multilevel framework. Although, the GHG emission reduction objective is recognised as a

pressure, it is not seen as an urgent problem, rather the objective can be achieved gradually through 'system improvement'. Yet, the sudden fall of the global oil price has put great pressure on the oil shale industry and has thus made the Estonian Government address this pressure by relaxing fiscal regulation, in particular by the reduction of environmental taxes. Herein, the regulative change can be seen as a relaxation of the control policies that according to Kern et al. (2008, p. 4101) are particularly important in order to pressure regime actors and enable market conditions to advance green innovation. As Markard et al. (2016) argue policies may encourage the processes of energy transition as well as they may constrain it, the tax reduction in Estonia indicates to the latter. By reducing the pressure on the incumbent companies, market conditions for the emergence of innovative alternatives are simultaneously reduced. Moreover, the relaxation of landscape pressures comes at the expense of environmental impacts.

Further, this regulative relaxation is mainly understood and explained in relation to the importance of the oil shale industry for Ida-Virumaa that in essence expands to as far as energy security and national sovereignty. The lack of alternative solutions is inscribed to the problem formulation, whereas the need to maintain the industry is perceived as the solution. Holmberg (2008) noted that the oil shale industry has become a problematic, yet tolerable necessity for Estonia. The oil shale industry is not only perceived as a necessity by governmental and industry actors but also by the representative of RE company. Thus, the importance of oil shale is constantly being re-constructed as essential for the Estonian economy, the social wellbeing of Ida-Virumaa and national security. Environmental losses that occur as a result of the oil shale industry are barely mentioned by the pro-oil shale discourse coalition. Even so, those sayings encompass a reference to the EU GHG emission reduction objective.

Thus, it becomes evident that the Low carbon economy Roadmap endeavour to promote economic benefits through innovative RE development has been excluded from the dominant problem definition. Although environmental concerns are cognitively aspired by EMÜ and ELF, the framing of the concerns builds on the economic and social development goals, as the dominant concepts in the Estonian energy discourse. Whereas the anti-oil shale discourse coalition seeks to solve the problem of "how to exit the oil shale based energy (and economic) system", the dominant problem definition posed by the pro-oil shale discourse coalition seems to originate from the quantitative objectives of the EU Low carbon economy Roadmap. Consequently, the dominant problem definition could be phrased as follows: "how to comply with EU long term objectives without limiting the competitiveness of the oil shale industry". With no urgency to deal with the issue, the market based solutions are perceived as being suitable to guide the necessary steps towards the 80% GHG emission reduction objective. Thus, the dominant problem formulation

itself prevents solutions that encourage innovation towards RE as the persistence of a fossil fuel is inherent in it. Thereby 'system improvement' is perceived to be the key for energy transition and the 'system innovation' can be left unaddressed (Meadowcraft, 2009). Kemp et al (2005b) have argued that focusing only on the improvement options that fit the existing system, will increase the lock-in effect and restrain innovation.

As the dominant story-line focuses on 'system improvement' rather than 'system innovation', the lock-in effect of the existing energy system is reinforced. Holmberg (2008) argues that the lack of alternative energy sources and competition enhance the lock-in of the oil shale industry. Inversely, the lock-in could be reduced by slowing the technological progress of the oil shale industry and by developing competing technologies. Thus, it can be further seen that the dominant problem formulation does not only reject large-scale changes in the energy system but also deepens the lock-in of the existing system and the oil shale industry.

Further, the dominant story-lines appear to oversee the emphasis of developing RE as described by the Energy Roadmap. The market based approach can be seen to encourage 'system improvement' that inherently excludes the potential of RE in the fossil fuel-based Estonian energy sector. Yet, in Estonia, the market based approach enables Nelja Energia, and potentially other RE companies, to develop and expand its services beyond Estonia. Although the company currently does not seek to substitute oil shale based electricity, it may happen in the future as Nelja Energia and other RE companies mature and continue to enter the market. Geels et al. (2007) has argued that if niche-innovation, such as Nelja Energia, evolves and grows while the incumbent actors, like EE, are under pressure, then niche-innovation may be able to break into and replace the existing regime. In this context, the EU market may enable RE companies to outgrow the incumbent actors. Consequently, new questions on national energy security may arise, if for instance, the RE technologies constructed in Estonia become largely owned by foreign companies.

Although, there is a lot of uncertainty towards the future of the Estonian energy sector, the discursive space is largely dominated by the socio-economic values held by governmental and industry actors.

8 Conclusion

The aim of the study was to understand how the transition to low carbon economy is translated in the Estonian context. Based on my findings, the Estonian energy discourse about the future remains contested. Yet, according to the dominant story-lines presented by the governmental and industry actors, the transition to a low carbon economy in Estonia is interpreted as meeting the numerical GHG reduction objective. As the energy discourse about the future of the Estonian energy sector is dominated by economic and social values, wherein oil shale holds a central position, the innovation towards RE technologies is discarded. Thus, the energy transition pathway is likely to develop along the line with system improvement, wherein the existing energy system would be modified to comply with the EU regulation. Moreover, the developments in the energy sector consider climate change mitigation and environmental development insofar as it is obliged by EU climate and energy policy objectives.

8.1.1 Further research

There is plenty to be studied in the future in relation to energy, politics and environment in Estonia. Holmberg (2009) notes that the changes in social attitudes could potentially erode the prevalence of the oil shale industry. As my study showed, the discourse was inclined towards economic and social development goals, further research could focus on the public opinion and attitudes towards the oil shale industry and Ida-Virumaa, particularly in relation to environmental impacts and responsibility.

More so, focusing on the public opinion on RE could prove to be interesting for revealing consumer awareness and the acceptability of RE. Individual preferences towards RE could explain the resistance and support, and could prove to be useful for energy companies and decision-makers. Moreover, focusing on media publications that have discussed the energy production could reveal if and how the framing of oil shale and RE has changed over time. Furthermore, actors' perceptions about the potential of various RE sources in Estonia would be a great addition to the present study.

A great contribution to the discourse analysis would be to study the perceptions of the people living in Ida-Virumaa in order to illuminate how they sense the surrounding environment and the oil shale-based activities. It could be important to go beyond the social importance story-line and investigate how the people 'on the ground' see their world.

From a different angle, institutional studies could contribute with an in-depth

understanding of how the formal and informal institutional rules further limit and enable the emergence of different opportunities, alternatives, and the decision making among actors. To pose a hypothesis, I would say that various actors and interest groups are formally accepted and involved but have a rather low impact on the decisions, possibly due to informal institutional rules.

9 References

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Appendix

Overview of the interviews

Actors /perceptions	**MKM**	**EMÜ**	**ELF**	**Nelja Energia**	**KKM**	**Eesti Energia**
Limitations for the transition to low carbon economy	actors low interest in cooperation; ETS does not function properly	wrong reasoning on political level for action; old academics are trapped in the oil shale know-how	ineffective JOKK schemas to comply with the EU regulation; power imbalance between the actors (imbalanced representation of interests)	unstable regulative environment	Lack of the EU-wide collective action	technological, local natural conditions are limiting the development of RE
Perceptions about EU energy-related objectives	The EU is being altruistic; long term objectives are indicative, not obligatory; state only needs to reduce GHG emissions; ETS is expected to do the job; local measures are free of choice;	in order to be successful we should not depart from the idea that the EU requires something	international attention on climate change helps to draw attention on local scale; the EU objectives in Estonia are two folded- as oil shale under pressure, plan to increase timber utilisation as biomass	create market for 4Energy services in Europe; Uncertainty in relation to post-2020,	the main aim is 80% reduction of CO_2 in national level; ETS is seen as the main instrument that should enable this	carbon neutral means biomass to be combusted; objectives are translated into national policies that then are being followed by EE
Perception of own role in shaping the energy sector	create good conditions for free market economy in Estonia, without the state intervention; increase welfare through enhanced competitiveness	keep eye on oil shale industry; speak to the politicians and citizens	tries to contribute to political change via public opinion; organise actions to draw public attention; educate public; rely on think tanks and science	use their know-how to establish EU-projects in Estonia to sell green energy abroad	mediate the views; support MKM; establish climate politics 2050 which builds on CO_2 price; main idea is to produce fossil and renewable energy and increase efficiency, reduce emissions by taking advantage of research,	satisfy the owner (state), i.e profit, valorise natural resources with less impact, ensure competitiveness; follow ENMAK; positioned itself as oil shale enterprise; find ways to transform different waste and sub products

					development and innovation	into valuables, substitution effects; long-term steps are determined by market and demand; no revolution, rather utilising existing capital;
Perception about renewables	RE not an objective in itself; good renewable sources in Estonia; renewable automatically refers to the term "subsidy".	RE is the future; possibility to get rid of oil component in economy; transition needs real vision not a vision document; RE to be integrated into network to overcome any gaps	asks for more distributed system; RE should be subsidised in order to increase the share in energy mix; possibility to mitigate risks; innovation takes place in the world; efficiency must be improved, e.g. to reduce the quantities of biomass needed	good wind conditions in Estonia is a business advantage; no fuel component is second market advantage; wind is the cheapest production method; renewables cannot currently be held accountable for 100%	national RE objectives have to be met; RE requires innovation that is yet not available; RE seen take lions' share of the energy mix; RE will be subsidised for 12 years since their establishment, only wind having limited to 600GW annually; Estonia seeks to meet the minimum possible targets for RE as planned by MKM.	RE seen to have a lot of limitations. hydro, off-shore wind not optional in Estonia; No accumulation technology; solar can be incorporated into a small heat-el system. Main RE is biomass; elsewhere in EU RE subsidised while new fossil based power plants are established behind the scene;
Perception about the role of oil shale	oil shale has potential; focus on oil production to improve efficiency and reduce GHG emissions; shale oil just like any other oil is a good export item;	common good; has negative impacts on environment; socio-economic problems related to oil shale worsen in time; industry will crash if no change; best use for oil shale would be chemical industry	oil shale is responsible for 80-90% of env problems; ideally alternative for using oil shale in chemical industry	oil shale carries social responsibility in Ida-Virumaa; the industry provides a lot of jobs making it irreplaceable;	oil shale industry works to improve itself, show initiative; the socio-economic crises has to be postponed in order to develop a strategy, market will dictate	utilise as long as demand exist and as long as the state wishes; oil shale supports the establishment of RE; introduce new ways of utilising oil shale;